IOWA STATE UNIVERSITY
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Volume 14
Issue 4 *Fall 2008*

Article 2

July 2015

# Who's Using All the Ethanol?

Bruce A. Babcock
*Iowa State University*, babcock@iastate.edu

Michael Boland
*Kansas State University*, mboland@k-state.edu

# Who's Using All the Ethanol?

***Bruce A. Babcock***
*babcock@iastate.edu*
*515-294-6785*

***Michael Boland***
*mboland@k-state.edu*
*Guest Contributor*

U.S. consumers are on track to consume 138 billion gallons of gasoline in 2008 (down from 142 billion gallons in 2007) and approximately 9 billion gallons of U.S.-produced ethanol plus perhaps another 800 million gallons of imported ethanol. Fuel blenders have a strong incentive to use all this ethanol because they receive a 51¢-per-gallon subsidy (the blenders tax credit) from taxpayers. In addition, since February of this year, the price of ethanol has been less than the price of gasoline. U.S. Environmental Protection Agency (EPA) regulations allow blended fuel to contain up to 10 percent ethanol. California regulations allow up to 5.7 percent blends.

## Benefit of Blending

The net benefit of replacing a gallon of gasoline with a gallon of ethanol depends on whether gasoline blenders perceive that ethanol is a perfect substitute for gasoline on a volume basis or an energy basis. At a 10 percent blend, it is doubtful whether most consumers perceive a change in gas mileage, so it is likely that gasoline blenders value ethanol on a par with gasoline on a volume basis. Figure 1 shows the per gallon net benefit from using a gallon of ethanol instead of a gallon of gasoline. This net benefit equals the price of ethanol (as reported by the USDA's Agricultural Marketing Service for Iowa) minus the wholesale price of gasoline (as reported by the New York Mercantile Exchange for reformulated gasoline) plus the blenders tax credit. Multiplying the daily benefit by the daily quantity of ethanol used results in an aggregate benefit to gasoline blenders of approximately $7.4 billion from February 2007 to October 2008. To the extent that gasoline producers are also blenders, this benefit works to offset their losses caused by the negative impacts of expanded ethanol production on gasoline prices.

Given the large incentive to use ethanol, it is no surprise that a growing proportion of gasoline contains ethanol. The U.S. Department of Energy reports the proportion of both reformulated gasoline and conventional gasoline that contains ethanol. Reformulated gasoline is sold in regions of the country that are required to use it under the Clean Air Act. As shown in Figure 2, the phase-out of the additive MTBE in the spring of 2006 resulted in ethanol being used in practically all reformulated gasoline. Plentiful ethanol supplies and a large incentive to substitute ethanol for gasoline greatly increased the proportion of conventional gasoline that contains some ethanol from less than 20 percent in the fall of 2006 to more than 50 percent today. Currently, more than 70 percent of U.S. gasoline contains ethanol.

## The Blend Wall

The Renewable Fuels Standard (RFS) mandates use of 15 billion gallons of ethanol by 2015. Given that flex-fuel vehicles are primarily driven in regions where E85 is not available, almost all of this 15 billion gallons will be consumed as a 10 percent blend unless the EPA decides to allow higher blends. At a 10 percent blend, 15 billion gallons of ethanol would be blended with 135 billion gallons of gasoline. Unless total motor fuel consump-

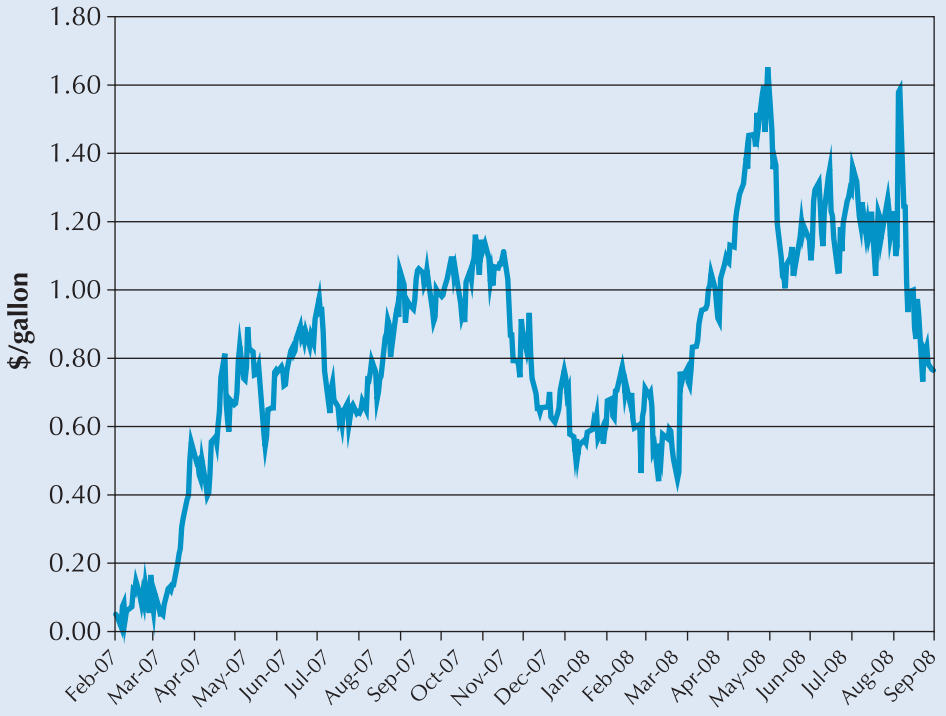


**Figure 1. Per gallon benefit to blenders of replacing gasoline with ethanol**

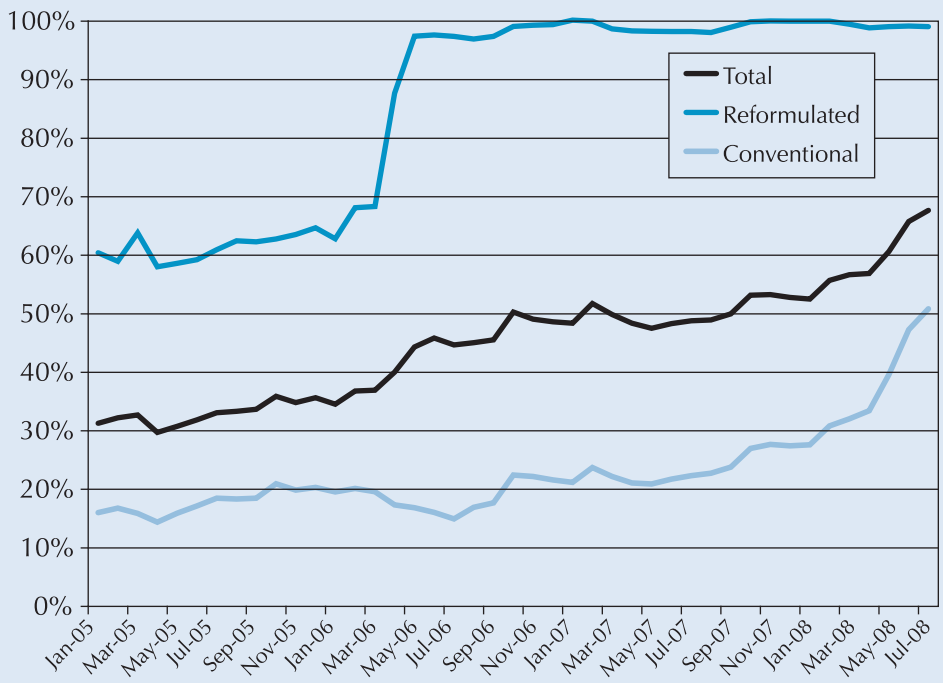


**Figure 2. Share of U.S. gasoline containing ethanol**

tion grows substantially in the next few years, nearly every gallon of gasoline will need to be blended at a 10 percent blend to meet the RFS. But it would be quite costly to blend every U.S. gallon of gasoline with ethanol. Ethanol is already being shipped to all the low-cost and most of the medium-cost blending locations. Continued large price discounts will be needed to attract investment in blending capability and ethanol transport to the remaining locations. Furthermore, a portion of the U.S. population apparently does not want to use ethanol blends in vehicles. Convincing these people would require hefty price discounts. It seems inevitable that the United States will hit an economic "blend wall" before the 15-billion-gallon mandate is met.

If this blend wall is reached when 85 percent of the U.S. gasoline supply is blended with 10 percent ethanol, and total fuel consumption stays at 150 billion gallons, then about 115 billion gallons of gasoline will be blended with 10 percent ethanol. This would account for a bit less than 13 billion gallons of ethanol, leaving 2 billion gallons of ethanol without a ready market. Forcing this ethanol into the remaining 15 percent of U.S. gasoline would severely drive down ethanol prices. Exporting the ethanol would be difficult because the United States would be vulnerable to charges that it was dumping subsidized ethanol on export markets.

## Is the Solution E12?

There is a contradiction between the RFS mandates, EPA blending regulations, and the interests of U.S. ethanol producers. This contradiction is even more evident once we consider the need to find a market for the additional 20 billion gallons of advanced biofuels mandated by the RFS. One short-term solution would be for EPA to simply find that E12 (12 percent ethanol blend) is a substantially similar motor fuel to E10. Then 15.5 billion gallons of ethanol could be blended into the 115 billion gallons of gasoline without causing the price of ethanol to be driven down even more. But this does nothing to make room for the advanced biofuels that may soon be hitting the market. ◆

*Michael Boland is a professor of economics and associate director of the Arthur Capper Cooperative Center at Kansas State University.*